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OF

NATURAL HISTORY,

AND

JOURNAL FOR RECORDING FACTS AND ANECDOTES

RELATING TO

QUADRUPEDS, BIRDS, REPTILES, FISHES, MOLLUSKS,
INSECTS, WORMS, ZOOPHYTES, &c.

THEIR HABITS, FOOD, RETREATS, OCCASIONAL APPEARANCE,
MIGRATIONS, NESTS AND YOUNG.

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Zoological Miscellany.

Numidian Crane shot in Orkney. — A fine male bird, in beautiful pluma the Demoiselle or Numidian crane (*Anthropoides Virgo*), was shot on Thursday, th 4th of May, at Deerness, east mainland, Orkney, and has since been preserved f Mr. Reid, bookseller, of Kirkwall. Two of the birds were seen at Deerness for som ays, and were pursued and shot at several times. When the one was killed, the oth flew over to the neighbouring island of Copinshay, and was not afterwards seen the Deerness folks, who describe the flight and walking of this remarkable bird as mething very graceful, and such as they had never witnessed before. Althoug hese birds (which are natives of Africa) feed on aquatic animals, small fish, frogs, ., in their native haunts, nothing was found in the stomach of this one but oats, eral grains of which were also found adherent on its tongue. It was not starve ike, weighing about five pounds, being considerably heavier than our herons. The ulls and lapwings continually attacked the two strangers whenever they walked or ged their way over the grass and oat fields, and they were heard frequently to r a hoarse scream when thus persecuted by their tormenters. The Demoiselle is uite new to Orkney, and is a valuable addition to our large list of birds. As far as can find in any work on British birds, it is new to Britain in a wild state. It ha een imported, however, and may be seen in a domestic state in the Garden of the ological Society.—*John o' Groat's Journal.*

At the Polytechnic Institution, Professor Pepper, in his Lecture on "Burn to Death and Saving from Death," has shown by experiment the effect of variou alts in rendering dresses incombustible. Alum seemed useless; phosphate of am nia allowed carbonization to take place without combustion, blackening the fabric w out flame; with borax the muslin became red hot without flame; tungstate of sod was superior to either of the last two, but perfect protection was attained by the of Matthews's patent starch, which is said to be compounded with sulphate of zin and sulphate of ammonia.

The captain of a whaler from the Shetland Isles lately discovered, in Hu on's Bay, an entirely new amphibious animal. It belongs to the Mammifera, is s ped somewhat like the lamantin, manatee and dugong, — those singular tropical an als which form the link between the hippopotamus and the purely aquatic anima ; it has paws like the bear, and, anomalously enough, eight of these—which spread in the water—disclosing webs between the fingers; a triple eye-lid, like the croc ile; and a voice described as very plaintive. It spends its days on land, its nights the water, and is thus invisible during the whole period of Arctic darkness. The ca ain took his prize to the Shetlands. It lives on sea-weed, and thrives hearti — *American Paper.*

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Palæontographical Society's Volume for 1859, published in 1861, and containing Owen's Fossil Reptilia of the Oolitic Formations, Part 1	0	15

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NOTICES OF NEW BOOKS.

‘ e *Birds of India; being a Natural History of all the Birds known to inhabit Continental India.*’ By T. C. JERDON. In two Volumes. Vol. I. Calcutta, 1862.

o the student of Indian Zoology it has long been felt most painfu y that the researches of naturalists, however valuable, however p found, are so scattered, and so difficult of access, that a force c parable to that of the quartz-crushing machine must be applied t hem before the pure gold can be eliminated and collected. To e mine thoroughly the lists of Mr. Hodgson and the valuable papers b Mr. Blyth, scattered through twenty volumes of the ‘Journal of t Asiatic Society’ and various English periodicals, is a task of no o inary toil; but when we add the works of Hartlaub, Temminck, H rsfield, M‘Clelland, Hutton, Sykes, Tickell, Gould, Pennant, Jard e, Selby, Bonaparte, Gray, Royle, Franklin, Burgess, Adams, T tler, Kelaart, and of Mr. Jerdon himself, the task becomes one of f rful and almost overwhelming magnitude, and certainly pallia s many little imperfections, some of which the author has himself p rceived, and amended in the list of errata. I feel disposed t be very lenient to printer's errors, on the principle that it is highly d ngerous for those residing in glass houses to pelt their neighb urs with stones; but we can scarcely charge on the printer such m stakes as calling the king of the vultures, Sarcoramphus Gryp us; or the condor, Sarcoramphus Papa, — mistakes by which the v ue of the work is certainly impaired. The captious critic might e large on this theme, and revel in a prolonged errata-list, dwelling e pecially on errors of punctuation, of which very curious examples m ght be cited;* but let those who undertake this task communicate d ect with the author, and refrain from publishing what might d mage the sale of a work the design of which is most excellent, and w ich will hereafter form, if completed, a foundation, a start-point, f all future writers on Indian Zoology.

he volume before me is only intended as the first of a series: the i roductory page, after pointing out the advantage, or rather necess y, of such a series, proceeds thus :—

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* For instance,—“ It is also said to hurl chamois, or even on the Himalayas Ovis, A mon off precipitous cliffs by a sudden swoop, to feed on the mangled carcases.”— (I 15).

"To meet this want it is proposed to publish a series of such manuals for all the vertebrated animals of India, containing characters of all the classes, orders, families and genera, and descriptions of all the species of all mammals, reptiles and fishes found in India."

This is indeed a vast and ambitious design; and the result will be invaluable if the work be executed in the same spirit in which it is conceived. The first volume, commencing with the vultures and ending with the thrushes, is now complete, and is prefaced by an introduction to the study of Ornithology, which contains a vast amount of useful and well-digested information; touching lightly on the views of Darwin as to the origin of species, on the fantastic arrangements of MacLeay and Vigors, and on the identity, parallelism or affinity of closely-resembling species inhabiting localities widely separated. There are also a few wholesome and sound paragraphs on the existence of a "special design" in creation, "a certain system" that may be studied with great advantage. The observations on arrangements are well and clearly written, the author entirely ignoring my binary arrangement of birds into Gymnogens and Hesthogens, yet making a separate order of the pigeons, because their gymnogenous character will not allow of their association with the hesthogenous game birds. But let the author speak for himself: as examples of his style I select the following detached and isolated passages:—

Falco peregrinator.—"The shahin falcon is found throughout the whole of India from the Himalayas to the extreme South, extending into Affghanistan and Western Asia. It is, however, far from being a common bird. Its habitual resorts are high rocky hills in the neighbourhood of jungle and forest-land, whether in a low or mountainous country, though the latter is always preferred. In the Carnatic, which is nearly devoid of forest, the shahin is but seldom met with, yet there are certain spots even there where individuals of the species resort to after the breeding-season, being chiefly young birds, and they are known to breed in various parts of the range of Eastern Ghauts. Its habits in a wild state vary somewhat according to the kind of country frequented. If a denizen of a forest, it watches on some lofty tree at the skirts of a glade, or hovers over it, ready to pounce on any unlucky bird that ventures to cross. In more open country it is necessitated to take a wider circuit in search of its prey, and is of course much more on the wing. Such birds are more highly prized for training than forest-bred birds, which are therefore seldom sought for. This falcon destroys large quantities of game, partridges, quails, &c., and is said to be very partial to paroquets. This assertion is corroborated by the fact of my having first obtained a specimen of the Alexandrine paroquet by the agency of a shahin, which pounced on a flock crossing a glade of a forest in Malabar, and carried one off, but dropped it on my firing at it. Very lately, too, one belonging to me having lost a partridge, at which it was flown, took a long though unsuccessful flight after some paroquets it spied high up in the air. One I shot in Travancore, just after sunset, was busily devouring a goatsucker it had captured. The shahin breeds on steep and inaccessible cliffs. I have seen three eyries, one on the Neilgherries, another at Untoor, and a third at the large waterfall at Mhow. It lays its eggs in March and April, and the young fly in May and June, when they are caught by the falconers. The royal falcon of the East (as its Indian name implies) is very highly prized by the natives for hawking, and it is esteemed the first of all the falcons, or black-eyed birds of prey (as they are called in native works on falconry), the large and powerful bhyri (the peregrine) even being considered only second to it. Although hawking is now comparatively at a low ebb in India, yet many individuals of this species are annually captured in various parts of the Peninsula, and taken for sale to Hydrabad and other places where the noble sport of falconry is yet carried on, and they sell for a considerable price. The shahin and other falcons are usually caught by what is called the Eerwan. This is a thin strip of cane, of a length about equal to the expanse of the wings of the bird sought for. The ends of the stick are smeared with bird-lime for several inches, and a living bird is tied to the centre of it. On observing the hawk, the bird, which has its eyes sewn up to make it soar, is let loose, and the falcon pounces on it and attempts to carry it off, when the ends of its wings strike the limed twig, and it falls to the ground. The birds usually selected for this purpose are doves, either Turtur risorius or T. humilis. The shahin is always trained for what, in the language of falconry, is called a standing gait, that is, is not slipped from the hand at the quarry, but made to hover and circle high in the air over the falconer and party; and when the game is started it then makes its swoop, which it does with amazing speed. It is indeed a beautiful sight to see this fine bird stoop on a partridge or florikin which has been flushed at some considerable distance from it, as it often makes a wide circuit round the party. As soon as the falcon observes the game which has been flushed, it makes two or three onward plunges in its direction, and then darts down obliquely, with half-closed wings, on the devoted quarry, with more than the velocity of an arrow. This is of course a very sure and deadly way of hunting, but though infinitely more exciting than the flight of short-winged hawks, is certainly not to be compared in interest to the flight of a bhyri from the hand after the heron or the douk (*Tantalus leucocephalus*). The shahin is usually trained to stoop at partridges and florikin (*Otis aurita*), also occasionally at the stone plover (*Œdicnemus crepitans*) and the jungle fowl. It will not hover in the air so long as the laggar, which, being of a more docile and patient disposition, will stay up above an hour."—(P. 26).

Haliastur Indus.—"The Brahminy kite is found throughout all India; abundant on the sea-coasts and in the vicinity of lakes and wet cultivation; rare in the dry plains of Central India and the Deccan. Colonel Sykes says that it 'usually seizes whilst on the wing, but occasionally dips entirely under water, appearing to rise again with difficulty.' This I have never witnessed, nor has any one I have questioned on the subject, and their name is legion. He also says, 'It is quite a mistake to suppose it feeds on carrion.' Mr. Smith, as quoted in 'Notes on Indian Birds,' says, 'This bird is among the first objects which attract the eye of the stranger, for they swarm about the shipping at Calcutta, and are useful in removing any offal which may be thrown away; but though their usual food is carrion, yet they kill fish, and not unfrequently carry off a snipe which a sportsman has levelled.' Hodgson says it feeds chiefly on insects, and quests like a Circus. From my own observations it certainly prefers aquatic food, and is most numerous in the vicinity of sea-shores, large rivers, tanks, and rice cultivation. About large cities and towns where there is much shipping, it gets its chief food from garbage and offal thrown overboard, or occasionally from what is thrown out in the streets and roads. Near large rivers or lakes it manages to pick off the surface of the water small fishes or a prawn occasionally; but its chief food, away from towns and cantonments, is frogs and crabs, which abound in all rice fields, and the remains of which last, picked clean, may be found so abundantly along the little bunds that divide the fields from each other. It will also eat water insects, mice, shrews, and young or sickly birds; and many a wounded snipe I have seen carried off by the Brahminy kite. In wooded countries I have seen it questing over the woods and catching insects, especially large Cicadæ, and I have also seen it whip a locust off standing grain. Now and then it gives hot chase to a crow, or even to a common kite, and forces them to give up some coveted piece of garbage or dead fish: when thus employed it exhibits considerable speed and great energy. It is much on the wing, soaring lazily about cantonments, or up and down rivers; but after a time seats itself on some palm or other tree, on the mast of a ship, and even on the ground. Near cities it is very tame and fearless, and I have often seen one catching fish thrown up to it by some pious Hindoo. It is said sometimes to carry off young chickens and pigeons, but I have not myself witnessed this. If the food it has seized be small, it devours it as it flies; but if large it generally sits down on the ground or the bund of a paddy field, or carries it off to a lofty tree."—(P. 102).

Milvus govinda.—"This is one of the most abundant and common birds in India, found at all elevations up to 8000 feet at least, especially near large towns and cantonments; and its vast numbers and fearlessness are among the first objects that strike the stranger from England, where birds of prey are so rare. Every large town, cantonment, and even village, has its colony of kites, which ply their busy vocation from before sunrise to some time after sunset. Every large camp, too, is followed by these useful scavengers, and the tent even of the single traveller is daily visited by one or more, according to the numbers in the neighbourhood. As is well known, kites pick up garbage of all kinds, fragments of meat and fish, and generally the refuse of man's food. When a basket of refuse or offal is thrown out in the streets to be carted away, the kites of the immediate neighbourhood, who appear to be quite cognizant of the usual time at which this is done, are all on the look-out, and dash down on it impetuously, some of them seizing the most tempting morsels by a rapid swoop, others deliberately sitting down on the heaps, along with crows and dogs, and selecting their scraps. On such an occasion, too, there is many a struggle to retain a larger fragment than usual; for the possessor no sooner emerges from its swoop than several empty-clawed spectators instantly pursue it eagerly, till the owner finds the chase too hot, and drops the bone of contention, which is generally picked up long before it reaches the ground, again and again to change owners, and perhaps finally to revert to its original proprietor. On such occasions there is a considerable amount of squealing going on. The vast numbers of these kites in large towns can hardly be realised by strangers. Captain Irby mentions having seen one hundred together, but in Calcutta and elsewhere two or three hundred may be seen at one time. They are excessively bold and fearless, often snatching morsels off a dish *en route* from kitchen to hall, and even, according to Adams, seizing a fragment from a man's very mouth; and several anecdotes illustrative of this are told by different observers;—*vide* Blyth, Sykes, Adams and Burgess. At our sea-ports many kites find their daily sustenance among the shipping, perching freely on the rigging, and, in company with the Brahminy kite, which rarely enters towns, snatching scraps of refuse from the surface of the water. Away from the haunts of man, some seek their reptile or insect food over the fields and hedgerows, or, with the Brahminy kites, hunt the edges of tanks, rivers and marshes for frogs, crabs and fish. The flight of the Indian kite is bold, easy and graceful, when once mounted aloft, though somewhat heavy on first taking wing; and it soars slowly about, in greater or less numbers, in large circles. When in pursuit of another kite it is capable of considerable speed, and shows great dexterity in suddenly avoiding any obstacle and changing its course; in this its long tail is of course a great help. Occasionally one may be seen dropping down almost perpendicularly from the top of a house, on a piece of offal in a narrow street, but in general it reaches the ground from a height by a series of oblique plunges. Now and then one will seize a chicken, or wounded bird of any kind; and Mr. Blyth mentions that he once knew one to kill a full-grown hen. Mr. Phillips says it is 'a very cowardly bird; for though it will carry off parrots and chickens, it is yet afraid of the crows and sparrowhawks. It will allow crows to pull to pieces a bit of meat before it, which it is evidently desirous to obtain.' This hardly accords with my observation; for though it is generally on sufficiently good terms with the crows in company with it on a heap of garbage, yet I have frequently seen it pursue a crow, and force it to relinquish some coveted morsel. Blyth, too, mentions that he had been told, on good authority, that a kite will sometimes seize a crow. The crows, however, often tease a kite, apparently without any object but that of a little amusement to themselves. The food of the kite is usually devoured on the wing, or, if too large, carried to the nearest house or tree. Mr. Blyth notices their collecting in numbers without any apparent object, especially towards evening. This I have frequently observed at all large stations, where the whole kites of the neighbourhood, before retiring to roost, appear to hold conclave. They are said to leave Calcutta almost entirely for three or four months during the rains. I have not noticed this at other places. As remarked by Buchanan Hamilton, they may often be seen seated on the entablatures of buildings, with their breast to the wall, and wings spread out, exactly as represented in Egyptian monuments.. The kite breeds from January to April, beginning to couple about Christmas; and great is the squealing going on at this time *more felino.*

Their cry is a prolonged tremulous squeal, whence the Indian name Chil (cheel). The nest is made of sticks, often lined with rags, and placed on trees, or on houses and other high buildings, more rarely on rocks; and the eggs, two or three in number, are generally dirty or greenish white, with or without a few pale brownish or rusty blotches."—(P. 105).

Spotted Owlet. — "The spotted owlet is one of the most common and universally-spread birds in India, from the Punjab to Burmah and Ceylon. It also extends to Persia and other parts of Asia. It is found everywhere, except in the dense forests; and it does not ascend the hills to any great height. Every clump of trees, and often a large single tree, especially near a village, is sure to be tenanted by a pair, or a small colony, of these noisy birds. It often takes up its abode, and roosts during the day, in the eaves of houses, or under the roof; and if anything disturbs its rest, comes forth with its noisy, chattering and disagreeable chorus. About sunset it is always on the alert, and soon after sunset it sallies forth to feed. It takes short flights, frequently seating itself on the ground, or a paling, or low branch, or outhouse; and thence captures beetles and other insects on the wing, or snatches one off the branch of a tree; now and then taking a low and undulating flight over the plain or garden, and dropping on any small mice, shrew, lizard or insect it may spy on the ground. I have seen it capturing white ants on the wing, along with bats, &c. Its usual call is a double note, which is frequently heard at all hours; and when there are several together they all take it up, appearing to be squabbling among themselves. It is a very familiar bird, not easily driven away from the quarters it has taken up. It breeds in holes of trees, or holes in walls, or old buildings, or in the eaves of houses occasionally. I got some eggs from the roof of my own house at Trichinopoly. It lays usually two to four eggs, which are white and round, from February to June. In Southern India it is regarded with aversion. It is used by some Shikarees for catching small birds. They snare one, or catch one with a rod and bird-lime, and, taking it to the jungle where the wished-for birds reside, tie it on the ground near a low bush, and smear most of the outer twigs of the shrub with bird-lime. The little owlet is soon espied by some bird, and as it is notoriously held in dislike by all small birds, a chatter of alarm is loudly given forth, and joined in by all new-comers, some of which perch on the well-limed branches; and when the Shikaree sees those he wishes caught, he runs from his place of concealment, and secures the captives. I am told that this mode of capturing small birds is often resorted to in Italy and the South of Europe." — (P. 142).

Common Indian Swift. — "The Indian swifts breed always in company, in colonies of various numbers. Their nests are composed of feathers, grass, straw, cotton rags, sometimes pieces of paper, agglutinated firmly together by the secreted mucus of their salivary glands, occasionally, perhaps, mixed with mud and rubbish. The inside of the nest is hard, glistening and smooth, and feels, says Theobald, like 'coarse card-board.' They vary much in shape; sometimes a first year's nest is open at the top, but they are usually closed, and communicating by the side; at times of moderate size, at other times very large, and communicating by a sort of tubular neck. They are very solid and heavy, and often very closely packed together. They are built against the rafters or beams, under the roofs of huts and houses, in the corners of old stone buildings, and in verandahs, either inside or outside, if there is protection from sun and rain. Various observers describe the nest as somewhat differently constructed. Burgess says that he has seen their nests crowded together under the roofs of old buildings, choultries and temples; one nest, from a rock, was built of mud, lined with grass, and contained two white eggs. Layard states that in Ceylon they breed in great numbers on rocks, also under bridges; and that the nests, built in clusters, are composed of mud and grasses, with a small round entrance, precisely resembling those of the martin (*Hirundo urbica*); the eggs from two to four in number, pure white. Adams says that the nest is of mud mixed with wool and feathers. In some of these cases the great weight and solidity of the nests may have led the observer to conclude that they were made with mud. The nest has generally a slight hollow in one place for the reception of the eggs, which are usually two in number, sometimes three, and pure white. Several birds, occasionally seven or eight, occupy one nest for roosting. The birds are very watchful at night, on the least noise, commencing their monotonous pipe. They are said by some to breed repeatedly, generally, I think, twice a year. It is a permanent resident in India, but does not appear to be found out of our province. The flight of this swift is fluttering and irregular on first sallying from their nest in the early morning, and also at sunset just before they retire to roost; small parties at these times may be seen flying close together, rather high up in the air, and slowly, with much fluttering of their wings and a good deal of twittering talk; and after a short period of this intercourse, all of a sudden they separate at once, and take a rapid downward plunge, again to unite after a longer or shorter interval. Their voice, remarks Mr. Blyth, is a sort of shivering scream rather than a twitter."—(P. 178).

Indian Edible-nest Swiftlet.—"In 1846 I paid a visit, in company with Mr. Ward, M.S.C., to Pigeon Island, some miles out at sea to the south of Honore, which was said to be a resort of these birds. We found a large cavern at one end of the island, with a few of the nests, but of the second make, and inferior to the first, being mixed with feathers and extraneous matter. There were no eggs at this season (the end of December), and we did not see any of the birds to identify the species. A native who had guided us to the cave said if we waited till 8 or 9 o'clock P.M. the birds would come. We instructed him to do so, and to catch some of them in a net he had with him for the purpose. Next day he returned to Honore, bringing several individuals alive of this species. He said they had not returned till 9 P.M. What a vast distance these birds must have come from, to have taken full three hours after sunset to reach their homes, and what powers of sustained flight are here shown! It is known to have other breeding places on the Malabar coast, *viz.*, the Vingorla rocks, where one hundred weight of nests is said to be produced annually; if so, this must be the largest breeding spot on the coast: also the Sacrifice Rock, twenty miles south of Tellicherry; besides, I dare say, others. I visited Sacrifice Rock in March, 1849. (It is so called because Hyder Ali was said to have left state prisoners, and others occasionally, on this perfectly bare rock to die of hunger and thirst). There is one cave here which had perhaps fifty to a hundred nests, and a few had eggs in them. Very few of the nests were of the first make, these being annually taken away by some moplahs from the mainland. The birds were at this time flying about, feeding on the flies which abounded at the edge of the rock. About twenty couples, perhaps, were present, not more. I doubt if all the places I have enumerated on the western coast would contain the nests of a quarter of the number of these swiftlets which I have seen at once in one locality. If so, where do the others breed? It has been suggested that they may nestle in inland caves, but all my inquiries have failed to discover any in India. Mr. Layard has, however, visited some caves in Ceylon where they breed."—(P. 183).

I have said that Mr. Jerdon touches lightly on the views of Darwin as to the origin of species, and on the identity or otherwise of closely-affined species inhabiting localities widely separated: the two paragraphs on these subjects are so well worthy of an attentive perusal that I need make no apology for extracting them. The hypothesis that a race may so alter, under altered conditions, that its differences shall become specific or generic, is asserted and maintained by Mr. Darwin and his followers; and the imposing array of facts, exhibiting such differences in progress, does as great credit to the industry, as the candid method of reasoning does to the ingenuous character of the author. In such cases as that of the roller, to which Mr. Jerdon alludes, I admit it is very easy to take either side of the question: the different geographical types may be called, or may be proved to the perfect satisfaction of one or other disputant, races, varieties or species; but supposing that geographical conditions can thus establish communities of individuals which a competent ornithologist shall describe and name as species, what shall we infer from this? Or, admitting that man, carrying out this capability for variation, can breed greyhounds, pug-dogs, Newfoundlands and King Charleses, or among birds all the varieties of pigeons and poultry, what shall we infer from this? Will it be asserted that any type of roller, dog or pigeon, exhibits and maintains an intermediate position between rollers, dogs and pigeons as they are and the acknowledged species, to which they are respectively more nearly affined? Does not the very existence of geographical races prove the homogeneity of some group of higher value than that race? It has been said that all the allied rollers will interbreed just in the same manner as dogs or pigeons, and that their progeny will be equally fertile: the only conclusion I can draw from this is that we must extend the imaginary limits we have hitherto made for a species. It will be seen that Mr. Jerdon does not consider the fact of interbreeding freely to be any bar to the distinctness of species: where, then, are we to look for a boundary-line?

Nothing appears to me more certain than that the change of species into geographical sub-species, and the advance of these to real species, necessitates the constant and enormous numerical increase of species. Is this the case? Is this increase of species proved? There is another point of view. It does not follow that because a roller is called Coracias indica when inhabiting one district, and Coracias affinis when inhabiting another district, — it does not, I say, follow that either race is advancing towards or receding from a given type: there is no evidence supposed, much less adduced, that indica has not always been indica, and affinis always affinis. There is no evidence even of change, leaving advance or decadence out of the question; but there is evidence, positive evidence, of the existence of every conceivable variety of plumage between the two extremes: the two birds have the same figure, the same habits, the same voice, and build similar nests; and let them vary as they may in colour, I can found no hypothesis on this variation farther than this, that I believe them to constitute but one species, which in colour is most inconstant.

This variability is an old acquaintance with a new face: let the entomologist study his series of Chelonia caia, Abraxas grossulariata or Peronea cristana: let him take extremes of each; and let him try to persuade some expert in the science that these extremes are new species. He will certainly be unsuccessful, simply because the expert would know better. May I venture to suggest that somewhat of the same practical knowledge would assist the ornithologist, and would preserve us from many of the long discussions we are now compelled to read on the non-permanence of species. Well do I recollect the time when we had dozens of these sub-species in Agrotis, in Sarrothripus, in Peronea, but increasing knowledge is sweeping them away: year after year they disappear from our catalogue, and not an advocate is ever found for their restoration. But the geographical sub-species or species of birds are not around our doors; we see them dimly through a vista of books and skins; and

> "Distance lends enchantment to the view."

"Some naturalists believe that permanent varieties are common in the animal kingdom, and Kaup calls them sub-species. Such persons consider that their differences from other individuals of what they would term the typical form, do not entitle them to the full rank of a species. Others, again, deny that permanent varieties exist, and state their conviction that even slight differences of colour and size, if found to be constant, are sufficient to constitute such individuals a distinct race or species. When such differences are found to co-exist with a different geographical distribution, I certainly prefer the views of those who look on all permanent distinctions of colour, size, structure, &c., as distinct species; and I believe that no change of climate or food, or other external circumstances, will produce any alteration in them or in their descendants, if they remain true to each other; and as yet I know of no recorded instance where any well-marked race has produced offspring differing from their own, or tending to revert to a supposed original type. That various nearly-affined species will propagate, *inter se*, and produce fertile offspring, I fully believe; as in the cases of the green pigeons of Bengal and of

Southern India, in the Indian and the Burmese rollers, the small cuckoos of S. India and those of Bengal, and in several other instances: but that this fact militates against their being species, and in favour of their being varieties, I think is not supported by many recent experiments in crossing. Of late years many species have been universally admitted as such, which were formerly considered simple varieties; and although, perhaps, the tendency of late writers has been to multiply species, in some cases most unnecessarily, yet in previous years the other extreme was taken, more especially by Schlegel and his followers. Our best naturalists and ornithologists now fully recognize the distinctness of permanent races. If varieties are once allowed, it depends on individual judgment or caprice to what extent they may be carried. In this country, where there are many very closely allied species among genera characteristic of the country, many of the species of Malacocircus and Hæmatornis would be classed as simple varieties by some; whilst others would perhaps allow some of them, whose different notes they might have observed, to be distinct species, and the rest varieties. Lastly, it is, I think, more convenient in practice to give each race a distinct specific name, than to speak of them as var. A or var. B of such a species.

"It is beyond the scope of the present Introduction to enter into the question of the origin of affined species. They may originally have sprung from type species, as Darwin teaches, and remained permanent in such localities as suited them, and not in others; or they may at once have been created as distinct species, and their place on earth fixed for them. We rarely find one trespassing far on the limits of the other; but where they do so meet, hybrids are not uncommon; but such hybrids do not appear to spread beyond the district where the two meet. As far as our brief experience goes, geographic distribution is against Mr. Darwin's theory. To give one example,—Malacocircus striatus of Ceylon is more allied to M. bengalensis of Bengal than to M. malabaricus, which is spread throughout a vast region between those provinces. Other examples will occur to the Indian ornithologist. In a vast province like India we have numerous instances of very closely allied races or species, especially when we compare the birds of India proper with those of the countries to the east of the Bay of Bengal; and many representative species, as Mr. Blyth aptly calls them, are found in Northern and Southern India, and in the Burmese countries, in some cases extending to a fourth race in malayana."—(*Introduction*, p. xxvi.)

EDWARD NEWMAN.

'*Die Schmetterlinge Deutschlands und der Schweiz Systematisch Bearbeitet.*' Von H. v. HEINEMANN. Nebst analytischen Tabellen zum Bestimmen der Schmetterlinge. Zweite Abtheilung. Kleinschmetterlinge. Band I., Heft 1. Die Wickler. Braunschweig, in Commission bei C. A. Schwetschke und Sohn. 1863.

Here we have before us a volume of 248 pages on the Tortricina of Germany and Switzerland, from the pen of Von Heinemann. The work appears carefully and conscientiously written, and contains detailed descriptions of 436 species. As the number of species in Wilkinson's 'British Tortrices' is 298, there must be 138 species described by V. Heinemann which do not belong to the British list; and we thus get the numerical proportion that the Tortrices of Germany and Switzerland are to the British species as three to two. The proportion is probably a little greater, for in many instances we find that where two closely-allied species had been differentiated by the writers in this country, their existence as distinct species is ignored by the writers of Germany.

V. Heinemann divides the group into ten genera, *viz.*, Teras, Tortrix, Sciaphila, Cheimatophila, Exapate (which he removes from the Tineina, and places here, following Cheimatophila Tortricella), Olindia, Conchylis, Retinia, Grapholitha and Dicrorampha.

With so few genera a division into sub-genera becomes necessary; and we accordingly find that Teras is divided into two sub-genera, Rhacodia and Teras. Tortrix is divided into fourteen, Sciaphila into four, Conchylis into four, Grapholitha into twenty, and Dicrorampha into two. But if we thus count all these sub-divisions as genera we only get a total of fifty, whereas in Wilkinson's 'British Tortrices' there are seventy-two.

The arrangement and classification of the group must certainly be a matter of some difficulty, as all recent writers are agreed in differing from each other.

We should think that this compact volume would have a beneficial effect in Germany and Switzerland in attracting more attention to this perplexing group of insects; but whether it will meet with a large circle of readers in this country appears somewhat problematical.

H. T. S.

Fascination of Birds by Light. — I have just been reading your very interesting chapter on "Fascination," in the 'Romance of Natural History,' and venture to bring before you an instance of the effect of a light, at night, on birds, which afforded me what at the time I considered as fine a night's sport as any schoolboy could wish for. In 1851 my father was living at Rainthorpe Hall, a well-known old house in Norfolk, not far from Long Stratton. One dark evening I went out with a bull's-eye lantern into some rambling sheds at the back of the place, and without making any noise took up my position in the corner of one of them, with my face to the wall, and the lantern placed so that a bright disk of light shone on the boards opposite me. The servant, an old soldier, Poyntz by name, under whose directions I acted, then began to shout and beat among the rafters at the far end of the shed with a long pole. We knew that the thatch was a favourite roosting-place for sparrows, and soon we heard them stirring above. He began to increase his efforts, and in a minute or two a frightened bird fluttered over my shoulder, and stopped flapping against the glass of the lantern. Then came another and another. I had brought a cage or basket (I forget which) with me to receive my game, but they came so quickly and so many at a time that I threw it away, and, holding the light between my knees, began with both hands to collect the sparrows which were crowding round, and allowed me to catch them without the slightest attempt to get out of the way. Both the side-pockets of my great coat, which for want of better accommodation I converted into temporary prisons, were soon filled, and still the birds were coming; so I took the pole, and resigned the lantern to the servant. I forget how many we caught in the one shed, but my pockets were bulged out with the poor little half-smothered creatures, and my companion had a very considerable show by the time we had finished. I should not have thought of troubling you with this account of what is, I believe, a well-known plan of bird-catching, were it not that since then I have several times repeated the experiment without success, although apparently under circumstances equally favourable. I remember once returning from a signally unsuccessful attempt to catch cray-fish in a little stream between Bex and Aigle, in the Valley of the Rhone: I was assured by a Swiss that if I had gone with a torch by night, instead of by day, I might have taken them in quantities, as they would always *collect to a light.* I returned to England too soon to prove the truth of his account. — *T. Digby Pigot; Primer Wood House, Watford, Herts, May* 5, 1863. — *Addressed to and kindly communicated by Mr. Gosse.*

On the Nidification of Small Birds. — Waterton, in one of his Essays, speaks about small birds building their nests and rearing their young in contiguity; but I apprehend that this is not a very common occurrence. With the exception of those of the Hirundines, I have seldom found the nests of small birds very close together. Last year I observed a wren and a robin building close to each other, in fact the nests touched, in a thorn-hedge that grew against a wall. The wren, however, deserted its nest before completion, disliking either my inquisitiveness or the proximity of its neighbour the robin. The latter went on and reared its young. The wren, it is well known, is an exceedingly jealous and wary builder; while the blue tit, on the other hand, is one of the most fearless, being, in short, the very type of persistent immovability when sitting. Last year I found a blue tit's nest with nine eggs, in a hole in the rotten bole of a plum tree; and, being anxious to secure an egg or two, I sawed two cuts down longitudinally, covering the eggs with dust and bits of wood; yet the bird went on with incubation after I had taken three eggs and completely transformed the site. Before commencing she would not come out when I rapped the hollow bole with the saw, and not till I began sawing and sending down bits of wood did she think proper to beat a retreat. She hatched the six remaining eggs buried in the chips and sawdust. I have often known eggs disappear very unaccountably. I have known thrush's and blackbird's eggs disappear from a nest in a night, when no human intruder has been near. I suppose these birds cannot remove their own eggs. I have found shells in nests, in places where no rats, weasels, polecats, snakes, magpies or crows frequented. Do birds sometimes eat their own eggs, or is the cuckoo the pilferer? The boys and keepers about here convict the cuckoo, and I am strongly inclined to agree with them. I do not remember to have found many shells before the arrival of the cuckoo. A correspondent of the 'Zoologist' (Zool. 8099) classes mice among the egg-destroyers; but is this an admitted and known fact? I should like to see a list of all the animals that destroy British birds' eggs, including of course birds; it would perhaps throw some light on the causes of the decrease of species. This April I found a brood of young robins starved to death, and the nest blown full of dead holly-leaves. The nest was pitched at the foot of a holly-bush on the north side, and a biting north wind had prevailed.—*G. Roberts; Lofthouse, Wakefield, May* 8, 1863.

Honey Buzzard (Falco apivorus) *in Shetland.*—I have lately obtained a very perfect specimen of the above, which was shot in the north of this island last winter. It appears to be an adult male, but only measures twenty-two inches in length.—*Henry L. Saxby; Baltasound, Shetland, April* 15, 1863.

Food of the Dipper (Cinclus aquaticus).—While this matter is still occupying so much of the attention of naturalists I beg to offer such small amount of evidence as I have been enabled to collect. During my residence in North Wales, some years ago, I paid particular attention to the habits of the dipper, chiefly with a view to determine the nature of its food. The gamekeepers in the neighbourhood being most determined in their efforts to exterminate this much-persecuted little bird, I was afforded an almost unlimited supply of specimens, and, although two-thirds at least of the numerous victims were examined by me, in not one solitary instance could even a trace of salmon ova be found in the stomach, although the spawning season was the very time at which the slaughter was most industriously carried on. In one instance only could ova of any kind of fish be detected, and these I have still preserved in spirit; certainly they do not belong either to salmon or to trout. The stomachs almost invariably contained water insects, but upon two occasions, much to my surprise, small fragments of trout in addition. I once saw my father shoot a dipper which, as it fell, dropped a living trout three inches in length. This also is preserved, and upon each side the deep mark caused by the bird's bill can very distinctly be seen. Among my notes for the same year in which this occurred I made the following entry. "Feb. 16th. This afternoon I saw three water ouzels at one time in the river, a little below the bridge. Two of them were feeding, and in a short time one appeared above the surface with a fish in its bill almost as long as itself. This was brought ashore, and all three birds, after having pecked at it for some time, left it. In the evening I saw them again at the same fish." Having in the first instance offered some exculpatory evidence with regard to the first and most serious charge, yet, while proving the culprit to be guilty of a minor offence, I most earnestly beg to add a strong "recommendation to mercy," upon the ground of the extreme rarity of that offence.—*Id.*

Blue Variety of Chaffinch's Egg.—At Zool. 8091 and again at Zool. 8035 were some remarks on the above colour of the chaffinch's egg. The other day I took a nest with three eggs. They were of a whitish blue, with a shade of darker colour of a reddish tinge over the sides. Two years ago I took another with five, much of the same appearance, but having none of the reddish colour. Both nests were in low bushes, and about two and a half or three feet above the water of a marsh which these bushes overhang.—*J. A. Harvie Brown; Dunipace House, Stirlingshire, May* 6, 1863.

Magpies Breeding in Confinement.—Some of your readers may have noticed my account last year in the 'Zoologist' (Zool. 8162) of my tame magpies. They will be interested to hear that my four remaining birds have paired. Each pair has taken possession of a lignum-vita tree at each end of my garden, from which they most assiduously drive away rook, royston, jackdaw, or heron, whenever they approach. One pair—those in the tree nearest my house—have built a large, deep nest, and the female commenced sitting yesterday on five or six eggs. I believe such an occurrence is previously unrecorded. I will report further progress.—*C. R. Bree; Colchester, April* 22, 1863.

The Cuckoo.—We have an old tale throughout Sussex that the cuckoo is turned out on Heathfield (pronounced "Heffel") fair day, which is on the 14th of April. This year I distinctly saw and heard it on the 16th.—*Thomas Thorncroft; Brighton, April* 21, 1863.

[Some of these country sayings are close approximations to the truth, and are worthy of great respect. I have been astonished at the number of communications that have reached me this year as to the arrival of the cuckoo in February and March, many of them backed by the authority of country gentlemen, clergymen and gamekeepers, yet, I regret to say, totally unworthy of credit. I fear that a willingness to believe in unusual occurrences is a part of the English character. In these instances the bird seen must have been one of our smaller hawks; the cry of "cuckoo" must have emanated from some juvenile adept in the mimetic art.—*Edward Newman*].

Deposition of Eggs by the Cuckoo. — An anecdote was lately furnished me in corroboration of the above, while on a recent visit to Dover, by Mr. C. G. Gordon, the able and enterprising attendant at the Museum there. He clearly remembers that a friend of his, thirty years ago, when walking in the park at Waldershare, the seat of the Earl of Guildford, observed a cuckoo sitting on the ground in a ride under the lime trees along the edge of the wood: he knocked it over with a stick, and in squeezing it by the throat to expedite its dying struggles, the soft and fluid yolk of an egg, flowing freely forth from the base of the mandibles, caused him to exclaim, "Why, he's got an egg in his mouth!" I have no doubt that similar instances of this habit of the cuckoo have given rise to the prevailing notion that it sucks the eggs of other birds.—*Arthur W. Crichton; 11, Eaton Place, Belgrave Square, April* 13.

On the Diving of the Sandpiper. — Captain Hadfield, in speaking of the diving of the sandpiper for food (Zool. 8524), says:—"Undoubtedly it could, but whether it would, or rather has occasion to do so, is the question. That it is not the sandpiper's usual habit to seek for food at the bottom of streams or pools, there can be little reason to doubt; and as to its taking pleasure in it, I am inclined to believe that it only dives when winged and pursued, having no other way of escape." The sandpiper, when frequenting fresh water, feeds on very similar food to the dipper, *viz.*, shell-fish, water insects and their larvæ, &c., as I have proved from dissection. Now, as this kind of food lies on the bottom, and as the dipper has occasion to dive, or at all events does so, I do not think it at all strange that the sandpiper should also find it necessary to seek for food by diving, especially when coupled with the fact of its having been seen diving by Mr. Leven, and that not "when winged and pursued." It is Captain Hadfield's belief that the sandpiper only dives when wounded, "having no other way of escape;" but as a naturalist I cannot believe that Nature has made a bird having the power of diving, and that power not to be exerted except when wounded. No gift is given without a purpose, and when a bird is formed for diving it has reasons for being so formed more cogent than escape "when winged and pursued." If Mr. Leven's statement of having seen sandpipers diving is not sufficient proof of their diving for food, I do not see what more is wanted, except the impossibility of seeing them take up food from the bottom when diving. I doubt if even the dipper has been seen to do this, though it will dive beside the flyfisher; whereas the sandpiper seldom permits an approach of twenty yards. Captain Hadfield makes a great mistake when he writes, "And if proof were wanting of its diving not being habitual or natural, it might be found in the fact that a man of Mr. Blake-Knox's experience of the species never yet saw a sandpiper dive except when wounded." I am not aware of having stated anywhere that I have had much experience of the common sandpiper (*Totanus hypoleucos*), for if I had had much experience of this bird's habits I am convinced I should have seen it dive when unwounded; but I stated (Zool. 8493) certainly no *other* species, to my knowledge, and I have had considerable experience, dive. As to my supposition being satisfactorily confirmed, I should like it to be well understood that I have written "seems to have been," not *has* been. I think there are very fair grounds for being satisfied as to the sandpiper diving for food — *First*, Mr. Leven's statement of having seen birds diving when unwounded; *secondly*, the Rev. G. C. Green's statement of having seen it run on the bottom, a habit of the phalaropes, gallinules and dipper; *thirdly*, the similarity of food to that of the dipper, a bird well known to dive; *fourthly*, its beautiful powers of diving, even when wounded, both from the surface and from the shore. As to land birds swimming, I maintain that they can propel themselves through water by their feet; I do not mean "flutter on for a time," but swim on for a time, of course not as well as a long-legged, broad-toed bird, like the oystercatcher. As to their plumage getting saturated, of course it will; so will that of a wounded gull.—*H. Blake-Knox; Dalkey, Co. Dublin, May* 11, 1863.

Eggs of the Blackheaded Bunting.—The other day I found a blackheaded bunting's nest with four eggs; three were of the ordinary colour, but the fourth was exactly like a yellow wagtail's, being grayish white, and minutely freckled at the large end. Is this an uncommon variety? If so, this note may be interesting to some readers of the 'Zoologist.'—*John A. H. Brown; Dunipace House, Falkirk, May* 16, 1863.

[Was it not a cuckoo's egg?—*E. Newman.*]

Notes on the Snowy Owl. By Henry L. Saxby, Esq., M.D.

In answer to repeated requests for information regarding the habits of the snowy owl, as observed in Shetland, it has been my custom to refer inquirers to the full and very accurate account of that bird published in 1822, by Dr. Edmondston, in the 'Transactions of the Wernerian Society of Edinburgh.' But this being now somewhat difficult of access, and, moreover, as observations made at a later period seem to be required (and I am not aware of any such having appeared in a collected form within the last few years), some notes of more recent date may not be considered out of place in these pages, although they contain very little more than a mere repetition of the account above referred to.

It appears that the snowy owl was first observed in Britain by Dr. Edmondston, who, in 1811 shot an adult male in this island (Unst), and soon afterwards presented it to Mr. Bullock, accompanied by particulars respecting its habits. The specimen was then exhibited in Mr. Bullock's Museum, and described by him as a British bird. Although at that time the species was far from being numerous it has now become even less frequent, as well as rather irregular in its visits, two or three years sometimes elapsing without its appearance, while at other times several individuals occur almost simultaneously. Formerly it used to be met with among these islands, especially in Unst and Yell, at all seasons of the year, but of late it has been observed only between autumn and the end of spring, and then usually after a north-east or north-west wind. On referring to my note-books I find the earliest instance of its arrival dated October 17, the latest April 30, (1863). There can be but little doubt that it no longer remains to breed here, although that it was most probably in the habit of doing so formerly the following extract from Dr. Edmondston's paper will show.

"I have not heard of its nest having been found either there (Shetland) or in Orkney, though, from meeting with it at all seasons, and from its constantly, during summer, frequenting the same situations in perfect plumage and well developed sex, it is reasonable perhaps to conclude that it breeds in Zetland. Indeed, I remember an intelligent peasant of Unst, whose veracity and acquaintance with his native birds I had occasion to be satisfied with, assuring me of his having once met, in the month of August, with a pair of this species, having along with them two others, which he termed their young. One of these latter he shot, but unfortunately I was not aware of the circumstance till the specimen was destroyed. He described it as of the same size as the snowy owl; indeed, in every respect the same, but of much darker plumage; and this is all precisely what we should expect on the supposition of this species breeding in Zetland." Some years afterwards Dr. Edmondston received information that a nest containing three well-fledged young birds had been found in August, on a low rocky ledge not far from Baltasound. The young were "of a brown colour, sprinkled with gray."

The food usually consists of rabbits and small birds, which are almost invariably swallowed whole. In the stomach of one I found an entire rabbit, so large that it was a matter of astonishment to me how it had passed the mouth of the bird, although most of the large bones were broken. While at rest during the day its favourite haunts are exposed hills covered with large stones, upon the shaded side of which it crouches, and although often difficult to approach on such occasions, its sense of hearing being very acute, it is nevertheless sometimes come upon unawares. A man in this island once crept up and knocked one over with his stick, injuring it so little that he carried it home and kept it alive for some time. Now and then, too, we hear of boys pelting one with stones. When an individual is known to have arrived in this island it is nearly sure to be discovered by any person who will carefully explore certain hills which have always been preferred before all other situations. These hills are strewn with large gray stones, intermixed with a few long-shaped white ones. I know several which have more than once been carefully stalked by the would-be owl slayer, and I could point out one of the latter in particular who has very often been thus deceived. But after all such an error may be in some degree excusable, for the bird is exceedingly difficult to discover while resting in such situations, so closely assimilating as it does in colour with the surrounding stones, and any person who resolved to walk up to everything bearing a resemblance to the object of his search, would require for his purpose a large amount of patience, a very long pair of legs, and a very long day indeed. In the immediate neighbourhood of its most frequented places of retirement large pellets of bones, skins and feathers may often be discovered. I have never heard of a single instance in which it has been met with upon the hills at night. It leaves them about sunset, and descends to the low grounds, returning next morning. In these islands the hill-tops are very frequently covered with snow, from which, in the day-time, a glare proceeds which is painful enough to human eyes, and, under such circumstances, more especially in climates still further north, the bird doubtless experiences no little benefit from the exceedingly perfct nictitating apparatus with which the eye is provided.

Much discussion has from time to time arisen concerning the feeding habits of this species, some observers maintaining that it seeks its prey by daylight only, while others as warmly contend that it is exclusively a night-feeder; but into this, as into most other arguments of a similar nature, the celebrated story of the chameleon might be aptly introduced. If it be permitted to one of my comparatively slight experience in the matter to venture an opinion, I may state my impression that in Shetland at least the snowy owl feeds both by night and by day, although very seldom during the latter period. My reasons for this supposition are based upon two very simple facts; first, that when the bird is seen during the daytime it is nearly always in a state of repose; and, secondly, that those examples which are killed early in the morning or late in the evening always have food in the stomach, while those procured in the daytime have the stomach either perfectly empty or containing food in which the process of digestion is far advanced.

Although during the daytime the bird is usually sufficiently upon the alert to avoid its enemies, yet this is not always the case; sometimes its inactivity amounts almost to stupidity. Two years ago I met some men coming out of the island of Balta who assured me that one of their number had a short time previously snapped a cap five times at a snowy owl, which only then became sufficiently alarmed to make its escape from the island. It was shot early one morning soon afterwards, and in its stomach I found a young rabbit. The only record which I can find of this species having been seen "on the feed" in the daytime occurred to my own observation in 1860, and was noted at the time as follows. "Nov. 2. In Balta, as I suddenly looked over the wall which divides the island, I saw a snowy owl make a rapid stoop towards some rabbits, and rise again without touching them, at the same time uttering a strange, rapid, chirping noise, which must have been pretty loud, for I heard it distinctly, although at the distance of more than a hundred yards; the bird then flew straight off towards Unst. It was not so white as an adult. This occurred about noon." In favour of its claim to be ranked among the day owls I have noticed that it is able to see for a long distance, even at times when the sun is shining brightly; a flight of golden plovers, passing very high above one which was sitting upon my arm, immediately attracted its attention. Too much value has evidently been attached to the fact that this species is very frequently met with between sunrise and sunset, for this is doubtless owing chiefly to the exposed nature of the ground which it frequents at such times. When the snowy owl appears in the daytime gulls, hooded crows, and even starlings at once join in pursuit, but until the annoyance becomes absolutely unendurable he usually regards them with contempt, being perhaps conscious of his own power of wing and claw. The flight of this species is strong and rapid, appearing to have a sturdiness about it which is not observed among the smaller owls.

I am not acquainted with the changes which take place in the plumage of those individuals which are kept in confinement, and even if I were changes occurring under such circumstances would be regarded with much caution. However, the examination of specimens of different ages and sexes, obtained at various times of the year, has enabled me to arrive at certain conclusions which I have recently had opportunities of confirming in my visits to museums and private collections.

It appears that the perfect plumage of the adult male is white, without spot, but that this state is not attained until after the lapse of several—perhaps many—years; and also that in younger birds the form, intensity and disposition of the markings are very little, if at all influenced by sex. I believe that the adult female also becomes white, having seen one very nearly in that state. Full growth is attained about the end of the first winter, after which size is a reliable indication of sex, a male seldom measuring more than twenty-three inches in length, while twenty-six inches is the usual length of a female. The younger the bird the more do the dark marks, especially upon the under surface of the body, partake of a barred appearance, the sharper are the edges and tips of the mandibles, and the broader and thinner, although no less keen, is the projecting inner edge of the middle claw. All of the claws are comparatively slender, and in colour resemble the bill, being of a bluish or grayish tinge, while in the adult those parts are black. Intensity of colouring has often been regarded as a mere indication of advanced age, but this, taken by itself, is no criterion, for at most times there is considerable variety of tint, even in the same individual, and very dark brown or black is nearly always present from the end of the first winter until some years afterwards. The truth seems to be that in old birds the dark tints merely predominate, and for this reason,—that as a general rule the lighter ones are the first to disappear. And yet this is not invariably the case, for specimens have been obtained which were perfectly white, with the exception of a few faint bars upon the wings or tail. Upon the body spots are usually darker than bars, and thus it is evident that the greater the abundance of bars upon the body the younger is the bird. The size of the spots probably decreases with age, and is said to be larger in females than in males, but of this I have never yet been able to satisfy myself. The parts in which the marks show the greatest inclination to linger are the occiput, scapulars, wing-coverts, tertials, and more than all upon the tail. Although an immature specimen may appear to have the ground colour, so to speak, of the plumage perfectly white, comparison with an adult will at once show that it differs in several respects. The plumage of the younger bird then looks grayish and dingy, and in some parts, particularly about the legs and feet, there is often a distinct rusty hue, and the feathers in the latter situation are comparatively short; besides this the whole of the plumage is of a peculiarly loose and "fluffy" character, a condition easily recognised, although difficult to describe. The oldest specimen in my possession is white, with the exception of a very few marks upon the wings and tail; the shafts of the quills are shining and yellowish, almost resembling ivory, and the plumage dense in texture, compact and slightly glossy,—altogether very different from that of a younger bird. It is a male, and weighed nearly four pounds; probably it was very old, for the muscles were unusually strong, and some of the tendons could not be cut with a scalpel. In this specimen, as in all others which I have examined, most of the smaller feathers, especially those upon the back of the neck and upper part of the breast, are gray at the base.

From all accounts it appears that the snowy owl is easily tamed, and thrives well in captivity. In March last I saw one which, having been wounded a few days previously, had been brought home alive. As soon as I let it out of the room in which it was kept it raised its feathers and snapped loudly with its bill, but very soon allowed me to handle it as I pleased, and quietly submitted to the operations of weighing, measuring, &c., not even attempting to escape, although it might easily have done so. It seemed rather weakly, and this was attributed to its wounds, but upon my offering it some water it drank eagerly, and became quite lively, although still continuing gentle, and showing no disposition to regain its liberty. It would not of its own accord take the water, but upon my inserting the edge of the saucer between its mandibles it immediately began to swallow the contents with great apparent satisfaction. It would clutch a large stick or the back of a chair firmly with its feet, at the same time standing nearly erect, but when placed upon a level surface it made no attempt to stand, nor could I hear that it did so even once during the whole period of its captivity; it merely rested upon its breast, with its legs folded beneath, and claws firmly clenched. On witnessing this it occurred to me as being rather strange that this species is nearly always seen in a crouching position when upon the ground, and most frequently erect when upon an eminence. Indeed its habits seldom require it to walk at all, but, nevertheless, Dr. Edmondston has from a distance observed it progressing by means of a series of awkward hopping movements. The unfortunate prisoner lived for about ten days, and then it was found that the shot had penetrated the lungs, but no other injury could be found. It was fed chiefly upon small birds, which it always swallowed whole, and it was very fond of fresh fish, but salted or dried food of any kind was invariably rejected. During the first few days it cast up no pellets, although it did so abundantly afterwards, and it was always more ready to take food in the evening than at any other time. The question of the disinclination of this species to stand upon level ground may be very easily decided by those who have had the opportunity of observing the specimen which was sent from this island some years ago, and which is still, I believe, in the gardens of the Zoological Society of London.

The snowy owl, or "kat-yogl" as it is here termed, is no favourite with the inhabitants of Shetland, its presence being regarded by them as productive of all kinds of evil both to man and beast. I shot one on the 25th of February last, about two hundred yards from Halligarth, and I heard an old servant remark, in reference to the event, "Well, what business had it about *this* house? ill thrift be till it!" It may serve to prevent some disappointment if I here warn visitors against being misled at any time by the statement that a "kat-yogl" has been seen in the neighbourhood, that term being applied indiscriminately to owls of all kinds, including the shorteared species which is not unfrequently met with upon the hills in autumn.

Henry L. Saxby.

Baltasound, Shetland,
May 8, 1863.

*Claim for Lacerta viridis to be admitted as a British Species.** — The specimen now exhibited was caught by a labouring man on a bank by the side of the road a little way out of Dorking, on the road to Reigate, on Friday, April 3rd, 1863, and brought to me the same evening, when I purchased it for the Museum of the Holmesdale Natural History Club. This species, which is frequent in the islands of Jersey and Guernsey, and also in the South of Europe, has not been previously known to naturalists as an inhabitant of England, and is not included by Professsor Bell in his valuable work on the 'British Reptiles,' although he alludes to it as having been supposed to occur both in England and Ireland, but gives it as his opinion that green varieties of a much smaller species, Lacerta agilis, have been mistaken for it. The occurrence of this solitary specimen is not sufficient in itself to establish it as a British species; but on showing it, a few days since, to Mr. John E. Daniel, a well-known naturalist, and who certainly would not have been likely to mistake this beautiful species, he informed me that a few years since he had observed three or four specimens of it on the heath about half a mile south of Wareham, in Dorsetshire, one of which he captured, and is quite certain of its identity with Lacerta viridis, a species which he is well acquainted with, having frequently seen it in Germany, and received specimens from the Channel Islands. The proof therefore of its occurrence in England is established; whether indigenous or as a naturalized species, remaining doubtful; but there can now be no reason why it should not be added to the British fauna. Gilbert White, in his 'Natural History of Selborne,' has the following remark, which probably applies to this species, "I remember well to have seen formerly several beautiful green Lacerti on the sunny sand-banks near Farnham, in Surrey; and Ray admits there are such in Ireland."—*J. A. Brewer; Holmesdale House, Reigate, April* 24, 1863.

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* Read before the Holmesdale Natural History Club, at Reigate, on Friday evening, April 24, 1863, when the specimen alluded to was exhibited.

[In connexion with this subject I take the liberty to cite the undermentioned passages on this subject, which have already appeared in the early volumes of the 'Zoologist':—

"I am told, on competent authority, that Lacerta viridis is quite frequent and even abundant in the neighbourhood of Herne Bay. I may add there can be no doubt about the species, and that it certainly is not the smaller green lizard of Poole, but identical with the species long known to inhabit Guernsey, as my friend Professor Bell has received a specimen from Herne Bay, but not in time to notice the discovery for the second edition of his 'British Reptiles.'"—(Dr. Bromfield, Zool. 2707).

"Seven or eight years ago a schoolfellow of mine at Eton, a native of Guernsey, assured me he had seen lizards in Devonshire precisely similar to the lizards of his own island, which latter, if I recollect right, he had often kept in confinement."—(John Wolley, Zool. 2707). "Nearly two years since a learned Professor of the University of Edinburgh mentioned that he had dissected a green lizard brought by a botanical party from the Clova mountains."—(John Wolley, Zool. 2708).

"On looking over the Reptilia of the Museum belonging to this city [Canterbury], I happily discovered a male and female Lacerta viridis. The particulars I obtained regarding the whereabouts the pair originally came from, the time, &c., are uncertain and dubious."—(Rev. W. H. Cordeaux, Zool. 2855).

On the other side, and as militating against the admission of this beautiful reptile into the British fauna, I may remind the readers that it has been repeatedly imported in large numbers from Guernsey, and turned ont with a view to acclimation on our heaths and wilds.—*Edward Newman.*]

The Palmated Smooth Newt (Lissotriton palmipes).—This reptile has formed the subject of more than one communication to the 'Zoologist,' but the localities in which it has been found are so few that additional information on that point may be acceptable. I may mention, then, that five-and-twenty years ago, in company with other small boys, I used to catch black-footed newts in a pond near Dartmouth, in Devonshire; the means of capture being of the simplest kind, consisting of a bit of twine fastened to a small bent pin, and a worm for bait. When 'Bell's Reptiles' was published I discovered that I had been unconsciously amusing myself with rarities. I have since caught a great many of these newts, and three years ago they were abundant in the same pond. That was my last visit to the locality. At the end of last month I spent a few days in Herefordshire, and near the village of Letton, about twelve miles from Hereford, I again had the satisfaction of seeing L. palmipes in abundance, although, so far as I could ascertain, they were confined to one pond. In this case, as well as at Dartmouth, L. palmipes was the only species to be found. I have sent a number of these little animals to the Zoological Gardens, and at the last meeting of the Zoological Society this species was exhibited in company with our L. punctatus and Triton cristatus, as well as with T. alpestris from Germany. The habits of L. palmipes do not apparently differ from those of L. punctatus. The males show the same lateral curvature of the tail, with a rapid vibration of its lash-like extremity during the love season. The females are now full of spawn. The slough of this species is cast entire, and, in most cases, at once swallowed by the owner.—*E. W. H. Holdsworth; 18, Osnaburgh Street.*

Toads in the Hole.—Sir A. P. Gordon Cumming writes to the 'Elgin Courier':—"In cutting the Inverness and Perth Railway through Lochnavandah Park, on Altyre, we have unceremoniously trespassed on the privacy and retirement of a numerous colony of ancient toads. The cutting is here from twenty to twenty-five feet deep, the lower part being through from ten to sixteen feet of freestone and red conglomerate. The interesting old residents are found in the red freestone about fifteen to twenty feet below the surface, where they certainly must have seen several nineteen years' leases out on the land above them. They are sometimes turned out by the heavy hand-pick or the great iron crowbar; but a blast of powder, of which a vast amount is here expended, seems to cause the greatest upset in the establishment, as a shot is sometimes the means of exposing as many as a dozen sleepy old fellows. They seem none the worse for their long repose, but after giving a few winks at the new light thus suddenly let in upon them, and taking several gasps of the unwonted air, they leisurely and deliberately proceed to hop and crawl down the line along the small watercourse towards the lower fields. I have seen them in numbers, and some of the men have counted above forty at once."—*Scotsman.*

Toads in a Hole.—A short time ago you quoted a letter written by me to the editor of the 'Elgin Courier,' in which I mentioned the discovery of living toads in making a railway cutting through rocks near Altyre. As many of my friends have questioned the authenticity of the signature, will you allow me to avow myself to be the writer, and in confirmation of my statements to forward the enclosed extract from the 'Forres Gazette'? The ground under which these living toads are found consists of two feet of black soil, from six to twelve feet of water-worn gravel, and four to eight feet of hard sandstone, all resting upon a bed of red conglomerate. While inspecting the railway works I have myself seen numbers of living toads taken out of the conglomerate at depths of from fifteen to twenty-four feet from the surface. An extensive and seemingly unbroken bed of rock covers the stratum in which these living toads are found. In sloping the sides of the cutting to one-and-a-half in one, we may anticipate a further release of prisoners. I shall be glad if any scientific person will account for the presence of living creatures in such a position.—*Alexander P. Gordon Cumming; 7, Park Street, May* 18.

"TOADS IN ROCK.—The 'Forres Gazette,' referring to a letter from Sir Alexander Gordon Cumming, of Altyre, which appeared in the 'Courier' some time ago, regarding the discovery of a number of toads found in a rock on the estate of Altyre, says:—'This fact was further confirmed last week by an examination of the men present at the blasting, who produced portions of the rock, showing the precise spots where some of the toads were imbedded. These were indentations on the stone of the size of a hen's egg cut lengthwise in half, but not so deep. When the shot went off the workmen ran to the spot, and found the toads scampering away. The nests, which became exposed in the solid rock by the blast, appeared to have a coating of soft black viscid stuff, in which the toads had lain. The rock is not sandstone, but a kind of conglomerate, very compact, but with open spaces, around which crystals of silica appear. That the toads were imbedded in the solid rock we have no doubt whatever, but to make assurance doubly sure the workmen are to carry large pieces of the rock to a given place, where they will be broken leisurely and carefully, in the presence of intelligent witnesses, who will be at no loss to verify the facts which may be presented.'"—'*Times' Newspaper*, *May* 25, 1863.

[The second or "confirmatory" account is but a weak and unsatisfactory one. In the first place, the toads *scampered* away: the term will not apply to the action of any toad with which I am acquainted. In the second place, the idea of breaking blocks of stone "in the presence of *intelligent* witnesses" seems to imply that this has not previously been the case; and I confess my distrust of the assertions of quarrymen who are rewarded for them by beer proportioned in quantity to the extravagance of their tales.—*Edward Newman.*]

Occurrence of the Lesser Forked Beard in Mount's Bay, Cornwall.—I have sent to you per parcel a fish which I believe to be the trifurcated hake, or lesser forked beard. I took it in Mount's Bay, on Friday last, the 17th inst., in six-fathom water, on rocky ground about a mile from the nearest land. I have kept it in reserve for my friend Mr. R. Q. Couch, who usually kindly takes charge of any specimens I take; but his indisposition renders it advisable that I should send the fish to some other scientific naturalist. As it is, I have had to take out a portion of the entrails and soak the fish in brine. I did this hurriedly last evening, on finding the fish rapidly decomposing, and too far gone to make spirits of wine available. The shape of the belly of the fish, which has been lost by gutting, corresponded with Yarrell's figure, but is more precisely represented by the belly-line given by Yarrell for the "unctuous sucker." The fish when alive had a perfectly smooth skin, and was marked with faint lines along its back. The lateral line was strongly marked, running straight from the tail to over the commencement of the anal fin, from thence arching high over the pectorals, being in this portion of its length raised, but having the elevated ridge perfectly soft; from just over the pectorals to the eye the lateral line ended in a broad shallow groove. The gill-covers were connected by a loose membrane. The grinding apparatus in the gullet was not visible without special examination when the fish was alive. I shall be happy to give any further particulars.—*Thomas Cornish; Penzance, April* 20, 1863.

[In connexion with this subject I have to mention the lamented death of Mr. Richard Quain Couch, a naturalist whose profound knowledge of fishes has rarely, if ever, been equalled in this country. His admirable papers in the earlier volumes of this journal are of no transitory interest, but will long endure as evidences of Mr. Couch's industry and great power of observation.

I regret that the fish was received in so advanced a state of decomposition that it was almost impossible to make a precise examination; but there is not the slightest doubt as to the species: it is the Raniceps trifurcatus of Fleming, a fish which my late highly esteemed friend Mr. Yarrell appears never to have had an opportunity of examining, but of which I once possessed a specimen, found amongst sprats offered for sale, and which I somewhat carefully described in the thirteenth volume of the 'Zoologist' (Zool. 4673). The extreme length of that specimen was 5½ inches, of that now before me 8½; the circumference of the smaller specimen immediately behind the pectoral fin 4¼ inches, of the larger one 7, and this after the removal of the intestines. Mr. Cornish has subsequently captured a third specimen with hook and line, and this he kindly sent to me also, thus giving me a good opportunity of examining it had I been able to give up the necessary time, but I have only had the opportunity of making a few observations. The extreme length of this third specimen is 11¼ inches, and circumference behind the head 9 inches. The gape of the open mouth exactly equals the greatest circumference of the body. In the interior of the mouth are five clusters of fine and slightly recurved teeth, three on the roof and two below the opening of the gullet; the first of these clusters is reniform, the next two nearly circular and placed transversely, and the two below the gullet also placed transversely and somewhat pyriform, but the smaller extremity very acute and pointing outwards: both jaws are also armed with sharp slightly recurved teeth, somewhat resembling those of a shark. First dorsal fin composed of a single ray, which gradually tapers to a point as fine as a hair. Ventrals composed of six rays abruptly decreasing in length, the first an inch and a half long, perfectly white at the extremity, and ending in a fine point; pectorals with twenty-two rays, each composed of four soft rays.—*E. Newman.*]

Are not Shrimps nocturnal? — The habits of the prawns and shrimps differ materially. Put the former into an aquarium, and they swim about vigorously, and are always alert and vigilant, being as active, restless and inquisitive as monkeys in a menagerie. Shrimps, on the contrary, are dull and stupid, and if there be sand in the aquarium they immediately bury themselves up to the eyes, which alone remain barely visible; if there be no sand they speedily die. As so little is thus seen of them, they are not very attractive objects in the aquarium. Upon approaching, the other evening after dark, a vessel containing some specimens, which I had thought unprofitable subjects from their being so little seen, I was agreeably surprised to find them *above ground*, and still more so to observe that upon throwing the light of the lamp full upon them they immediately buried themselves in the sand, and this they did repeatedly on being ousted from their favourite retreat. This points unmistakeably to a nocturnal habit, and an extreme sensitiveness to light. — *Thomas J. Moore, in 'Naturalist's Scrap Book,'* Part I. p. 4.

A Sabella Building its Tube.

By Philip Henry Gosse, Esq., F.R.S., &c.*

THE following particulars of a process of animal mechanics may possess interest for readers who study Marine Zoology under aquarian auspices, and I am not aware that they have been recorded before in detail. I give the *ipsissima verba* of my journal, written while the little mechanic was before my eyes. The account is an incidental testimony to the adequacy for aquarian purposes of the substitute for sea-water, the constituents of which I first made public in the 'Annals of Natural History' for 1854.

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* Reprinted from the 'Intellectual Observer' for March, 1863.

June 30. My large tank of artificial sea-water, made in August last, is now very rich in animal life. The stones and old shells are covered with a woolly down of (probably) ectocarpus, and the whole has the settled, old appearance of a natural pool bottom. Among the inhabitants is a Sabella, which answers in all particulars to Montagu's S. vesiculosa, except that it is much shorter than his specimen, being about one and a half inch long, and its tube, at least the free part, about two inches. The dark purple vesicles which he mentions, at the tip of the gill filaments, are in mine much more conspicuous than represented in his figure, that of the anterior filament on each side being much larger than the rest, and forming a stout, globose and nearly black ball; the others diminish to about one-twelfth on each side, where they disappear. These balls are placed on the inner or upper face of the filament stem, at the point where the pectination ceases, the stem itself being continued to a slender point beyond it—the "short hyaline appendage" of Montagu. From their great resemblance to the tentacled eyes of the Gasteropod mollusca I have little doubt that these are organs of vision; if so the protrusion with which the Sabella is furnished in this respect may account for its excessive vigilance, which is so great that not only will the intervention of any substance between it and the light cause it to retire, but very often it will dart back into its tube almost as soon as I enter the room, even while I am ten feet distant.

This morning I found my Sabella clean out of its tube, and lying on the muddy bottom below. I was afraid he was moribund, but he was actively wriggling, and his beautiful disk blossomed as widely as usual, though grovelling on the sand. Some six hours elapsed, when I perceived that his body was no longer naked, but enveloped in a new, loosely constructed but rather tightly-fitting tube, through the posterior part of which the naked tail was protruding, as yet unprotected. It was evident the Sabella was meeting the emergency of his situation by forming a new dwelling, and that he had commenced, though unseen by me, by making a ring of mud cemented with a gummy secretion around the neck, which ring as it increased in length was continually pushed farther and farther downwards towards the tail.

The process of natural manufacture is always interesting. I removed my artificer from the tank, and put him alone into an ample cell of glass with parallel sides, giving him plenty of water and a bottom of sand, on which I allowed to fall through the water a little clay, rubbed to a paste between my fingers in the water. As soon as the turbidity had a little subsided, so that I could use a lens, I had the gratification of seeing how he proceeded.

In order to make this intelligible I must briefly describe the structure of the parts engaged. All that is ordinarily seen of the animal is a flower-like disk protruding from the tube. This disk is composed of two semicircular fans (the gills), the pair forming a complete circle, except that the points of juncture, behind and in front, are marked by a slight opening. Each fan consists of twenty-one feathers, regularly radiating, and curling outwards with a beautiful turning-over of the tip, so that the whole disk bears the closest resemblance to a trumpet-shaped flower. The filaments, which I have called feathers, consist each of a slender stem, beset on the sides with two rows of beards (pinnæ), whose direction is upwards and outwards from the stem, so as to make a groove, of which the face of the stem is the bottom. The beards are in constant active motion, some being thrown inwards every instant, striking and, as it were, feeling the water, every one quite independently, moved by an impulse of its own. Under a high power (500 diam.) all the beards, and the exterior face of the stem also, are seen to be clothed with minute but rapidly vibrating cilia.

In the centre of the flower-like disk is the mouth, which is guarded by a pair of little pointed tentacles, and on the outside of the disk, at the base, there runs round a thin, fleshy, very flexible collar of membrane, which at the posterior opening of the fans, or that which is opposite to the two principal eyes, is produced into a pair of moveable, soft, tactile flaps, which turn outward and hang over the edge of the tube in the course of house-building.

All this being premised, and the workman's tools being described, let us see how he works with them. Suppose him to be lying along on the bottom, near one corner of the square glass vessel, so that through one side a lens can be brought to bear on one side of the animal, and through the other on the disk.

We first glance at the disk, taking a front view of the creature. The filaments of the gill fans are so active, bending inward and outward, and perpetually crossing one another, and the pinnæ are jerking hither and thither so incessantly, that we are for a while confused, and can make out nothing. We must fix our eye on some individual filament, and watch that heedless of all the rest. Now we perceive that the tip of this is bent over outwardly until the inner face is in contact with the bottom, the pinnæ expanding over the clay like the legs of the letter A. In an instant these close together, seizing, as with many opposed fingers, a little of the soft and impalpable clay, and at the same instant the filament is straightened from its recurved condition, and we perceive a minute pellet of clay lying between the pinnæ. The pellet takes a lengthened form, and presently glides quickly and equally along the groove of the pinnated filament towards the mouth carried along by means of the cilia with which every part is clothed. Glancing at other filaments on each side we see a similar pellet in each, at least of those which, as the disk lies, are in contact with the bottom. As we follow the tiny mud pellets to their destination we trace them to the mouth, where the two pointed tentacles stand guarding the entrance. These appear to guide the united pellets to the posterior orifice between the fans, through which we see the lump making its exit.

We can learn nothing more of its progress from this point of view, but let us now direct our lens to the side of the animal. Here we again see the soft lump emerging between the fans, and as it progresses the moveable fleshy flaps above described receive it and guide it to the edge of the tube, plastering it as if with trowels on the edge, regulating its thickness and smoothing it down. Meanwhile the animal slowly revolves on its long axis, by which means all of the filaments in turn are brought within reach of the ground, and thus the labour of feeding the trowels is fairly distributed, and also the deposit is made in succession upon every part of the edge of the tube.

The tube increases in length by means of this process with considerable rapidity, and it is not long before the animal is once more completely protected. Probably as the desertion of the tube was in this case voluntary, it is not unreasonable to infer that the formation of a new habitation is normal, and takes place at certain though probably irregular intervals through life. There seems to be an inner layer of gummy matter secreted from the collar on which the mud pellets are moulded; and often the lower portion of the tube—the first formed—is found in this class of worms firmly adherent to a stone, and consisting almost wholly of this gummy matter without any mud coating. The substance, which hardens in water and is insoluble, is of a horny texture and colour, a pellucid yellowish brown, and is probably composed of chitine. Perhaps in the case before me, if the animal had been reposing on a stone instead of soft mud and sand, the first formed portion of the tube would have been adherent.

I add Montagu's description (slightly condensed) of the species, the accuracy of which is proved by my specimen :—

"Sabella vesiculosa. Body with many segments, pale, dull orange, minutely speckled with white. Tentacles [gill fans] two, with about twenty-eight long ciliated fibres each, olive-green mottled with gray, partly in bands when expanded, not forming a circle but sub-convolute, the under part turning inward. At the points of each ray is a dark purple vesicle, most conspicuous on the anterior ray of each plume, terminated by a short hyaline appendage. Mouth gaping; lips whitish, with two slender cirrhi; behind the tentacles a scalloped membrane, surrounding the anterior end of the animal. Length six or seven inches. Tube coriaceous, but always coated with coarse sand and shells, ten or twelve inches in length."

Melitæa Cinxia.—As the time for the appearance of this local insect is close at hand, I send you the dates of its appearance for the last few years: — 1857, June 2; 1858, June 4; 1859, May 30; 1860, June 7; 1861, May 27; 1862, none.— *J. Pristo; Alverstone, Whippingham, Isle of Wight, May* 18, 1863.

Bombyx Callunæ: its Mode of Laying Eggs.—I have just been glancing over the 'Zoologist' for 1861, and in the paragraph "On the Habits of Bombyx Callunæ" (Zool. 7360), I find, "On depositing her eggs, which she lays around the stems of the food-plant," &c. Has not the writer of this observation mistaken the ova of Saturnia Carpini for those of this species, both of which occur in some abundance in the same locality? The former insect certainly deposits her eggs in clusters around the food-plant, the latter never. Having paid some attention to the habits of this species I submit the following note from my journal for 1861-2. "From one to two hours after copulation(which extends to about three hours) the female takes wing, and flies swiftly, in circles, over the food-plant (Calluna vulgaris), reminding one of the peculiar oscillating movement of the Hepialidæ, and dropping her eggs as she flies. The time thus occupied seldom exceeds from twenty to forty minutes; she then settles down, and rarely lives out the day." I shall have great pleasure in forwarding ova of this species to any gentleman desirous of breeding it, providing applications be sent not later than June 8th.—*George H. Parke; Halifax.*

Note on Amphydasis prodromaria.—From a large brood of this insect I have obtained thirty-four perfect specimens; a few were small, but most of them of the average size. The first, a small one, came out on the 27th of January, out of doors, when the thermometer was at 45° in the shade; but the greatest burst of them was on the 20th of March; thermometer nearly 50°. I had two out on the 16th of April, which were probably the last. With regard to the time of emerging, the earliest noticed was 11.45 A. M. and the latest about 2 P. M. On the 20th of March several had their wings fully grown by 12.30. Copulation appears to last from the dusk of evening to about 5 the following evening: one male was seen *in cop.* with three separate females. Cramped females were generally, but not in every instance, avoided by the males. One perfect female that had remained a week single from necessity, altogether failed in obtaining a partner. None of the impregnated females laid eggs till two days after copulation. One remarkable habit I have observed in all, males and females, though more in the males, from their being more lively,—that of tumbling over and over several times when disturbed, throwing a complete summersault by pressing the points of their fore wings against the ground.—*E. Horton; Wick, Worcester, April* 21, 1863.

Description of the Larva of Eupithecia debiliata.—Two days ago I received from Dr. Breyer, of Brussels, a box of larvæ of E. debiliata, taken by him in the neighbourhood of Brussels. All had spun up but three. From these I took an accurate description, and then sent them off the same afternoon to Mr. Buckler, who has, I doubt not, ere this made a far more accurate and life-like drawing. I hasten to give the readers of the 'Zoologist' a description of this hitherto undescribed and almost unknown larva. Rather short and stout, in general appearance resembling the larva of E. rectangulata. Ground colour dull yellowish green. Whole body rather translucent, and more or less suffused with yellow. Central dorsal line darker green than rest of body. Subdorsal lines wanting. Spiracular lines dull yellow. Head dusky brown or blackish. Belly destitute of markings. Feeds on leaves of Vaccinium myrtillus. Full-fed the beginning to middle of May. It is a dull uninteresting-looking larva, with but four distinctive characteristics. When full-fed it spins a slight earthen cocoon. My larva have not yet assumed the pupa state.—*H. Harpur Crewe; The Rectory, Drayton Beauchamp, Tring, May* 14, 1863.

Mine of Lithocolletis Larvæ mounted as Transparent Objects on Card-board.—In the report of the proceedings of the Entomological Society in the 'Zoologist' for February (Zool. 8348), I see that Professor Westwood exhibited leaves of various plants which had been mined, mounted on glass. A very good plan, no doubt, but rather too cumbrous for many collectors. I have found it a very neat way to take a piece of paper or card and cut a hole in it, then stick on the leaf, so that the mined portion of it shall be over the hole. By this means both sides of the mine can be looked at (a great advantage in Lithocolletis mines), and may be held up to the light to show the nature of the excrement, and the finer portions of the mine. I may be permitted to remark here that I consider that those who breed Micro-Lepidoptera would do well to preserve the leaves they have mined also. — *H. W. Kidd; Godalming, April* 11, 1863.

[This note was accompanied by a most beautiful example of a bramble leaf mined by a species of Lithocolletis, and exhibiting its course from the deposition of the egg to the exit of the imago. I hope the plan may meet with that favourable reception it deserves.—*Edward Newman.*]

Occurrence of Acrognathus mandibularis in Epping Forest.—I have great pleasure in announcing the capture of this very rare beetle in Epping Forest. As the locality is a new one, and I have taken more specimens than the total number ever taken before, the capture possesses considerable interest. I took it first on May 11th, and since then on several occasions.—*Thomas Blackburn; Woodford, Essex, May* 20, 1863.

Note on two British Species of Philonthus.—

PHILONTHUS SUCCICOLA, *Thomson*, *Skandinaviens*, *Col.*, ii. Tom., 157, 7.
P. carbonarius, *Erichs. Gen. et Spec. Staph.* 437, 15 (*nec var.*) *Kraatz*, *Ins. Deutschl.* ii. 577, 9 (*nec var.*) *Waterh. Cat. Brit. Col.; nec Gyll.*

The specific name succicola is given by Thomson (*loc. cit.*) to the Philonthus hitherto known in England and elsewhere as P. carbonarius, which appears not to be the species published with that name by Gyllenhal (Ins. Suec. ii. 319, 35): the above alterations must therefore be made in our lists. Our insect differs, according to Thomson, from the true P. carbonarius in the following points: — The head is less; the thorax punctuated on the sides; the penultimate joint of the antennæ is transverse, whilst in P. carbonarius it is not so broad as long; and, in addition to the emargination of the seventh abdominal segment beneath in the male, the *sixth* segment is widely (and gently) emarginate, the sixth segment in P. carbonarius, *Gyll.*, exhibiting no emargination whatever. In the latter species, moreover, the legs, margins of the abdominal segments beneath, and the terminal segment beneath entirely, are pitchy brown. Both Erichson and Kraatz considered the true P. carbonarius as merely a variety of the insect to which Thomson has applied the name succicola; but they appear to have overlooked the structural differences in the emargination of the male, and joints of the antennæ, &c., although the variations in colour did not escape their notice.

PHILONTHUS AGILIS, *Grav. Mon.* 77, 70 (Staphylinus). *Kraatz*, *Ins. Deutschl.* ii. 603, 37.
P. varians, *var.* d., *Erichs. Gen. et Spec.* 470, 70.

I find this species (not hitherto recorded as British I believe) in my collection, and have also observed it in the cabinets of Mr. Douglas and Dr. Power. It is closely allied to P. varians, *Payk.* (which it must immediately follow in our list), being in the section with the thoracic striæ composed of five punctures, and having the anterior coxæ fusco-testaceous: it may, however, be distinguished from P. varians by its smaller size and different colour; the elytra not being, as in that species, black with a greenish reflection, and often bearing a red spot; but dull black, with the hinder margin at the extreme apex only subferruginous. The elytra also are narrower, with the punctuation rather more remote, and not exhibiting so much transverse rugulosity; the thorax is a little more contracted in front, and the antennæ especially are much shorter, with the penultimate joints transverse, being moreover deep black in colour. —*E. C. Rye; 284, King's Road, Chelsea, May 22.*

Capture of Ptilium affine, Omalium nigrum, O. brevicorne, O. testaceum, and a new Species of Omalium. By the Rev. A. MATTHEWS, M.A.

I FEEL much pleasure in recording the addition of another well-marked species to the British list of the genus Ptilium. During a recent excursion to the fens of Norfolk with my friend Mr. G. R. Crotch, I met with a single specimen of Ptilium affine (Erichson, Nat. der Ins. Deuts. iii. p. 27); but although I perceived the value of my capture at the time, and looked carefully for more, I did not succeed in taking any other specimen.

P. affine belongs to that section of the genus which is distinguished by the three impressed lines on the disk of the thorax, and may be known from its allies by the lateral lines appearing at first sight parallel for their whole length to the central channel, but when closely examined each line shows a faint curve at each end in contrary directions ; it is also much more convex, and larger than any other of the same section, except P. cæsum, *Er*.

It appears to be extremely rare on the Continent.

Omalium nigrum (Grav. Mon. 212, 17) is closely allied to O. florale; it differs from that species in having longer antennæ, of which the first five joints are red and the remainder black ; the thorax is also smaller and of a different form.

Taken in Oxfordshire.

O. brevicorne (Erichson, Gen. et Sp. Staph. ii. p. 884). This is an elongate-depressed species, allied to O. planum. The shortness of its antennæ will at once serve to point it out without detailing other characters.

O. testaceum (Erichson, *l. c.*, p. 885) is also one of the narrow species, and somewhat resembles O. concinnum, but is shorter than that insect, with the thorax much smaller and narrower, and is always of a paler colour.

Three specimens of this and one of the foregoing species were found by myself at different times during last summer, in rotten wood near this place.

The insect which I am about to describe under the name of Omalium crassicorne was taken by my brother, the Rev. H. Matthews, near Waddington, in Lincolnshire, about the year 1850 ; and as I have been unable to determine it by the descriptions contained in Erichson, Gyllenhal, or any other work to which I have had access, the species is probably unknown.

OMALIUM CRASSICORNE, *n. s.*

L. c. 1¾ lin. Rufo-castaneum, æneum, nitidum, antennis pedibusque læte rufis.

Caput piceo-nigrum, distincte sed remote punctatum, inter antennas elevatum, glabrum, nitidum deinde foveâ transversâ, rugosâ, curvatâ profunde impressum, fronte prominulâ, foveâ parvâ utrinque ante ocellos, oculis magnis, valde prominentibus.

Pronotum paulum longitudine latius, capite latius atque longius,

lateribus rotundatis, angulis posticis productis, acutioribus, angulis anticis obtusis, marginibus anticis et posticis fere rectis; glabrum, nitidum, punctis sat profundis, segregatis impressum, foveisque duabus ovalibus, planitie glabrâ interpositâ, pone medium; rufo-castaneum, marginibus dilutioribus.

Scutellum modicum, punctatum.

Elytra pronoto latiora, ac fere duplo longiora, punctis valde profundis, confluentibus rugose impressa, distincte striata, striis ad margines laterales atque apices evanescentibus.

Abdomen latum, depressum, alte marginatum, angulis segmentorum productis, glabrum nitidum, supra lævissime sed distincte punctatum.

Antennæ breves, robustæ, capite paullo longiores, ad apicem gradatim incrassatæ, articulis 6—10 transversis, apicali magno acuminato.

Pedes robusti, simul cum palpis atque antennis læte rufi.

Differt ab O. Salicis, cui proximum est, antennis brevissimis, pronoto minore, ac puncturâ totâ dissimillimâ.

Head pitchy black, distinctly and very remotely punctured, with an elevated smooth space between the antennæ, behind which is a deep, rugose, transverse fovea, somewhat curved towards the middle; forehead prominent, with a small fovea in front of the ocelli. Eyes large and very prominent.

Thorax rather wider than its length, wider than the head and somewhat longer, with the sides rounded, and the posterior angles produced and acute, the anterior angles obtuse, the posterior and anterior margins nearly straight; smooth and shining, distinctly and remotely punctured, with two slight oval depressions behind the middle, and a glabrous space between them; rufo-castaneous, with the margins pale.

Scutellum moderate, punctured.

Elytra about twice as long as the thorax and wider, rugosely and confusedly punctured, distinctly striate, with the striæ evanescent towards the sides and apex.

Abdomen broad, depressed, strongly margined, with the angles of the segments produced; smooth and shining, clearly and very finely punctured.

Antennæ short and stout, scarcely longer than the head, gradually incrassated towards the apex, with the 6—10 joints inclusive transverse, and the apical joint large, acuminate.

Legs robust. Antennæ, legs and palpi bright orange-red.

This species differs from O. Salicis in the shortness of its antennæ, smaller size of the thorax, and very dissimilar punctuation.

A. Matthews.

Gumley, Leicestershire,
May 22, 1863.

Capture of Bembidium Mannerheimii in the North of Scotland. — In September, 1857, I caught a specimen of a Bembidium at Tair, in Ross-shire, which I could not then determine; however, on the appearance of Dr. Schaum's book I made it out to be B. Mannerheimii, and my diagnosis has recently been confirmed by Mr. Waterhouse.—*Thomas John Bold; Angas' Court, Bigg Market, Newcastle-on-Tyne, May* 28.

Note on Trechus obtusus. — This recently-detected British insect appears to be not rare in the North of England, as on examining my series of T. minutus I find one-half of them to be T. obtusus, and taken in widely-separated localities.—*Id.*

Capture of Mycetoporus nanus in Northumberland. — In the early part of this month, and in April, I took four specimens of Mycetoporus nanus, *Grav.*, which are new to the British fauna. Of its habitat I can only say that it was found in depressions in the sand on the sea-shore near Hartley, and where it had apparently been blown by the wind. Mr. Waterhouse informs me that a single pale example of the same insect has been detected by Mr. E. C. Rye amongst insects taken near Croydon. —*Id.*

List of English Genera of Coleoptera taken in China.—

Drypta (very common)
Brachinus
Clivina (2 species)
Dyschirius (2)
Carabus
Badister (like B. peltatus)
Chlænius (5 or 6)
Oödes (1)
Pogonus (2)
Agonum (3 or 4)
Steropus (1)
Argutor (1)
Broscus (1)
Celia (1)
Curtonotus (1)
Anisodactylus (2)
Ophonus (1)
Harpalus (2)
Stenolophus (4 or 5)
Bradycellus (1)
Peryphus (2)
Bembidium (7 or 8)
Cybister (1)
Laccophilus
Hydroporus
Haliplus
Falagria
Aleochara
Homalota
Leucoparyphus
Tachinus
Conurus
Heterothops
Quedius
Creophilus (maxillosus)
Leistotrophus (common home species)
Philonthus
Othivus
Lithocharis (3 or 4)
Sunius
Pæderus (2 very common)
Stenus (5 or 6 or more)
Bledius
Platystethus
Oxytelus
Trogophlœus
Megarthrus
Scydmænus

Hister
Saprinus (nitidulus)
Epuræa
Carpophilus
Læmophlœus
Silvanus
Cryptophagus
Atomaria
Typhæa
Dermestes
Syncalypta
Simplocaria
Heterocerus
Helophorus
Ochthebius
Hydræna
Berosus
Cercyon
Cetonia (like C. aurata, *Linn.*, and others)
Onthophagus (many)
Copris (like C. lunaris)
Aphodius (a few species)
Agrilus
Trachys
Throscus
Athoüs (and others)
Cyphon
Scirtes
Lampyris (2)
Opilus
Corynetes (ruficollis)
Anobium
Dinoderus (very common)
Scaphidema
Notoxus (2)
Mordellistena
Melöe (vulgaris? appeared in January)
Asclera
Bruchus
Apion (3 only)
Sitones
Polydrosus
Cleonus (3)
Errirhinus
Bagoüs (several)
Ceuthorhynchus (and allies)
Sitophilus (oryzæ, of course)
Tomicus
Gracilia
Crioceris (3)
Cryptocephalus
Chrysomela
Phædon
Phratora
Galeruca
Phyllotreta (and others)
Cassida (2)
Coccinella
Bryaxis.
Telephorus (a few just now out).—*George Lewis; Foochow, March* 16, 1863.

Life-Histories of Sawflies. Translated from the Dutch of M. SNELLEN VAN VOLLENHOVEN, by J. W. MAY, Esq.

(Continued from page 8476).

ALLANTUS SCROPHULARIÆ, *L.*

Hartig, Blatt. und Holzwespen, p. 186, No. 1. *Bouché, Naturgesch, der Insecten*, p. 138. *Brischke, Abbild. und Beschreib.*, p. 7, Plate 1, figs. 4 and 4 *a*.

Allantus niger, antenni, tibiis, tarsisque fulvis, prothoracis margine, scutello et linea sub illo, fasciisque abdominalibus segmentorum 1 ac 4—9 flavis.

I am indebted to the kindness of M. Van De Roo, Westmaas, for my acquaintance with the larva of this sawfly. I had read the descriptions of this insect by Bouché and Hartig, and subsequently the account given by Brischke; but I had never actually seen the larva. Notwithstanding that I had carefully looked for it in the neighbourhood of the locality where I had found the imago, I had never been fortunate enough to meet with it; and I was obliged to content myself with what was given by the above-named authors. I was accordingly much pleased to receive from M. De Roo some individuals which he sent me on the 1st of October, 1858, and which he had met with at Velp, on the stems and leaves of Scrophularia nodosa. They were in various stages of growth; the smallest, as represented on plate 7, fig. 1, of a bluish very pale gray, with black spots; the largest, in size and colouring as represented at fig. 2, of a more ashy gray tint. The length of the smaller was 2 centimetres, that of the largest 2.5. In all the head was oval, depressed on the forehead, black to just below the eyes and just above the antennæ; thence to below the trophi obscure greenish gray; the parts of the mouth were of the same colour, with the exception of the sharp upper jaws, which were brown. Moreover, the whole head was beset with a pale gray velvety pubescence. Bouché says, "Der fast-Kugliche Kopf hat hellbraune Augen," which is repeated by Hartig; this, however, is not the case. The eyes, which are very small, are shining black, as stated by Bouché, but are placed in an obscure greenish gray round spot.

The skin of the larva has a somewhat velvety appearance. The body is broadest at the second and third segments; but generally the larva can hardly be called attenuated. There are twenty-two legs, the fourth segment alone being apodal. The legs proper are yellowish pale gray, with a black base to the first joint, and brown claws; the claspers, as also the ventral surface, are immaculate yellowish white. The spiracles have pale brown margins; below them on each segment are two black spots in the centres of two dermal projections. Along the middle of the back is a row of eleven larger, round, dull black spots; thence to the stigmata are three waved lines of spots, of which there are six on either side of each segment, which is divided into five dermal folds. A triangular spot above the stigma is the largest of these six. In order to make this clearer we have given at fig. 3 a separate representation of one of the middle segments magnified: this is a more exact and clearer figure than that given by Brischke.

After the last moult the larva has an entirely different appearance, as we before observed in the case of another species of Allantus (tricinctus). It is then of an uniform reddish brown, with a darker dorsal stripe. The head has become very shining and of a reddish brown colour, with a darker crown; the eyes are inserted in black spots, and the upper jaws are of a deep brown; the hairs, which before entirely covered the head, have disappeared; the segments of the body seem to be more wrinkled, which may be attributed to the fact that the length of the body is somewhat lessened; lastly, the margins of the spiracles are darker.

Most of my larvæ moulted for the last time between the 1st and 5th of October.

According to an observation of M. De Roo, which that gentleman subsequently communicated to me, the larva, when very young, is more greenish in tint.

As already stated, these larvæ fed upon the leaves of Scrophularia nodosa; Bouché writes that they are also to be met with on the Verbascum, which appears not improbable, as this is likewise the case with the larvæ of some Cucullia which are found on both plants.

The larvæ of our sawfly were very inactive, remaining for the most part quite still, and rolled up spirally on the under sides of the leaves, as shown at figs 2 and 4. On feeding, which they appear mostly to do at night, they eat holes in the middle of the leaves.

Shortly after their last change of skin my larvæ buried themselves in the ground, and there constructed rounded cocoons of small grains of earth. About the end of May or beginning of June they change within the cocoon to pupæ, which are at first whitish and afterwards orange, but further do not appear to have any noteworthy peculiarities: one is represented at fig. 5.

The insects remain at rest in this state for about three weeks, when the imagos make their appearance. The perfect insect is very prettily coloured, and has something of the appearance of Allantus tricinctus, already described [Zool. 7718], but may be immediately distinguished from this latter by its ferruginous antennæ. They are about 13 mm. long; head and thorax beset with short hairs; abdomen entirely smooth. The general colour of the body is black. The subclavate antennæ have the third joint the longest, and are ferruginous or obscure orange. The clypeus and upper lip, as also a mark on the cheeks, are yellow; in the thorax the following are coloured yellow:—a spot above the first pair of coxæ, two lines on the prothorax running obliquely forward, the tegulæ, a spot beneath the anterior wings, the scutellum and a small line below it, and lastly a pretty large spot above the posterior coxæ. The femora are black, although in some examples the front of the first two pairs is of a greenish yellow colour. The tibiæ and tarsi are ferruginous, like the antennæ; the claws, which are sharply bidentate, are more of a brown tint; in the interspace is a blackish pulvulus.

The posterior legs in the male are much broader and of stouter build, as shown in figures 8 and 9, in which the first represents the leg of the male, and the second that of the female. The wings are ferruginous or golden, the nervures being red in the basal half and dark brown at the apex; the stigma is brownish red; a blackish stain extends from the stigma across the inferior portion of the two marginal cells.

The abdomen has a yellow band on the first segment, divided by a line in the middle; the third segment has a yellow streak on either side,—in some female examples these are found on the second also; the fourth and ninth segments have yellow bands, which are much broader in the female than in the male, as shown in our figures 6 and 7, the latter representing the abdomen of the male. The male has only eight segments, and at the apex the organs of generation may be seen protruding between two cup-shaped valves. The ovipositor of the female is black.

M. De Roo writes me that he thinks there are two broods; however, considering the slow rate of growth of the larva, I cannot share his opinion. He grounds his supposition principally upon the fact that he observed imagos between the 11th and 14th of July, whilst young larvæ were in existence which moulted on the 17th. We must await the result of further observation to ascertain the fact on this point.

We have not reared any parasites from this sawfly.

The Lanthorn of Fulgora Laternaria.—Extract from a letter dated June 26, 1862, from Mr. R. J. Treffry, Honda, New Granada, to Mr. George Treffry, Exeter:—"I have sent to you by this packet, or it is sent to Carthagena to go by it, a small parcel containing several specimens of the great lanthorn-fly: these have been collected by a man who has taken refuge in the forests of the High Central Andes, near Mariquita, in New Granada, to avoid soldiering in these revolutionary times; and because I send so many you must not think them abundant. The so-called lanthorn appears to answer as a drum to reverberate its hum and as a 'buffer' to protect it, when, in its rapid flight, it strikes against an obstacle, as it is elastic and horny, and I have taken the live insect by the shoulders and pressed the end of the lanthorn until its end was reflected back against the hump behind, without any inconvenience to the insect. I think its use is what I have stated,—an instrument of sound and a 'buffer.' I cannot tell why it is called the 'lanthorn fly,' for it gives no light. I speak from my own experience, during a residence of more than thirty years in New Granada, and from the information of the men who catch them."—*Robert John Treffry; Honda, New Granada.*

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In this number a large amount of arrears are disposed of; but contributions, most of them received in June, remain on hand, with the following signatures:—**Insects**—S. Stone, H. Hadfield, G. C. Green. **Radiata**—W. R. Hughes. **Entomological Society**—This was necessarily delayed on account of its unusual length. **Sucklers**—M. S. Coussmather. **Birds**—Clermont, J. H. Gurney, H. Blake-Knox, J. Ranson, E. H. Rodd, J. C. Atkinson, H. Reeks, C. Stubbs, Frederick Russell, John Dutton, Murray A. Mathews, Edward Neave, Thomas Dix, H. Stevenson, Robert M. Leven, H. L. Saxby, C. Doncaster. **Reptiles**—E. H. Rodd. **Mollusks**—G. H. Parke.

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Entomological Club Dinner,

At the "Running Horses," Mickleham, on Thursday, July 2, 1863.—John A. Power, M.D., F.R.G.S., in the Chair.—*Stewards:* Ferdinand Grut, Esq.; Edward Newman, Esq.; Samuel Stevens, Esq.; G. R. Waterhouse, Esq.

Breakfast at 11; Dinner at 5 precisely.—Tickets 15s. each, to be had only of the Stewards.

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